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Regional Meeting for the Initiation
of a Regional Network for Microelectronics
in the ECLAC Region (REMLAC)*

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SOME CONSIDERATIONS ON THE CONTENT AND MODALITIES OF A PROGRAMME OF WORK FOR REMLAC**

a note prepared by the UNIDO secretariat

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* Co-sponsored by SELA/ECLAC.

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The most concrete action of the meeting will be to consider and initiate a programme of work for the network. The value of the network to its participants will depend on the content of its programme and the efficiency of its implementation. This note deals with some general considerations on the network activities, the modalities of developing and implementing a programme and the possible content of such a programme. The ideas developed here are based on the interactions with policy makers and technologists in several countries of the region, the findings of the experts and the recommendations of previous meetings.

General Considerations

The activities of regional co-operation that may be performed as part of the programme of the network should be related to and supported by ongoing national or international activities to the extent possible. In other words, the programme of the network should form part of a total system of activities in the field of microelectronics in the region.

The programme should lend itself to participation by all member countries of the network. This will not, of course, preclude in the programme bilateral and multilateral co-operation among those countries which are interested in a particular activity.

A medium-term programme for six years may be developed but pending its development and funding, interim activities should be commenced without delay. For example, the present meeting itself initiates certain network activities by considering informatics policies, microelectronics-telecommunications interactions, status of R and D and the use of public purchase as an instrument of microelectronics development.

There can be a natural phasing of the activities in that those which will contribute to the strengthening of national actions and national capacities for regional co-operation could be taken up first. In this respect activities such as exchange of experience in policies, exchange of information, strengthening of national focal points, training etc. could be started early.

The activities in the programme of the network could be funded through a combination of different sources such as:

(a) national financing of national activities of relevance to the network including funding of national activities by external funding sources;

(b) national financing of regional activities of the network;

(c) financing of the programme or projects under the programme by funding agencies such as UNDP and others; and

(d) funding of activities by international organizations.

It should be noted, however, that a major source of funding of regional programmes may have to be the funding agencies. Though a few activities could start straight away with a minimum of expense a critical mass of funding should be obtained early in order to secure the success of the network, taking into account the importance of the technology for the region and its rapid development.

The programme could be formulated in a modular fashion, adjustable to present and anticipated resources. While the programme should allow sufficient flexibility and the implementation of several co-operative projects it should not be too diffuse to lack a decisive thrust in certain areas of importance to the region. It should incorporate an element of review and evaluation through periodical meetings of the network.

Contents of the Programme

The co-operative programme of action recommended by the UNIDO/ECLA expert group meeting in June 1982 1/ contains several elements of action which were later supported in similar terms by the SELA expert group meeting 2/, which could form the basis for the range of actions to be undertaken. In addition, the findings of the experts who interacted with policy makers in four Latin American countries need also be taken into account.3/ On this basis the following observations are made on the possible content of the programme of the regional network.

(1) Early identification and assessment of technological advances in microelectronics. This type of activity has also been emphasized by the Fourth General Conference of UNIDO. The UNIDO secretariat has assisted the governments of Mexico and Argentina in considering the establishment of monitoring groups. Such monitoring is also taking place in Brazil and probably in other countries in the region. A network of national monitoring systems could be established to help share the workload and also to develop a regional approach leading eventually to a regional strategy.

(2) Exchange of information and co-operation in regard to public purchases. The meeting has before it a paper relating to the overall concept of public purchasing as an instrument for development of microelectronics.4/ In addition, the papers on the interrelationship between telecommunications and microelectronics provide important ideas in this field. The network's programme could promote exchange of information and experience in this respect and more in-depth national studies to be undertaken by participating countries.

1/ ID/WG.372/17, pp. 6-7.

2/ More or less the same activities were also identified as elements of a Latin American Programme of Co-operation recommended by the Second Meeting of high-level governmental experts in the field of science and technology held by the Sistema Economico Latinoamericano (SELA) in May 1984, later supported by the tenth regular meeting of the Consejo Latinoamericano in October 1984 (Decision no. 200).

3/ Report on the UNIDO Mission Preparatory to the Establishment of a Regional System for Microelectronics in Latin America (REMLAC) (background document).

4/ ID/WG.440/1

(3) Interrelationship between telecommunications and microelectronics. The exploitation of this interrelationship is not only necessary for the successful development of each of the two sectors but can also be used as a tool for their growth. The meeting may consider the type of regional co-operation that could be promoted.

(4) Socio-economic assessment of the impact of the technology. Policy research and impact analysis will have to be encouraged in the participating countries and mechanisms for exchange of information among them promoted. The approach should be to help develop an integrated long-term policy approach to industrial and technological development in the electronics field.

(5) Identification of application possibilities in critical and priority sectors relating to domestic and external markets. Developing and utilizing applications is an important step in the introduction of microelectronics for the socio-economic development of the countries in the region. It may be necessary to launch detailed surveys at the national and regional levels for identification of potential application areas of microelectronics in relation to national and regional needs; promote national interdisciplinary core groups and their interaction at the regional level to promote applications; and promote software houses and system houses at the national and regional levels. It would be desirable to formulate an inventory of the application of devices, equipment, computation tools, specific standards, services and suppliers of microelectronics in order to save time and avoid a duplication of effort in the evaluation of already existing products in the Latin American countries. This inventory might be centralized in one of the countries and could be fed through the evaluations conducted by REMLAC's various institutions.

(6) The establishment or expansion of design centres. As the UNIDO/ECLA meeting stressed, mastery of the technology is not possible without a capacity to develop design and manufacturing capabilities for components. Regional co-operation is possible and indeed necessary in regard to design and fabrication capacity. This could be a major activity for the network. In this context, the UNIDO study on the

establishment of a silicon foundry cum design centre may be referred to 5/. It is possible to establish a series of interlinked national and regional design centres and link them in turn to a silicon foundry preferably to be identified or established in the region.

The UNIDO experts who have had discussions with policy makers and technologists in four Latin American countries in February 1985 have reported that it was generally agreed in the countries visited that the countries participating in REMLAC should formulate a project for the manufacture, at a silicon foundry to be selected, of a multiproject chip. Such a chip would consist of a series of circuits of commercial interest to each country, designed by each of them. Each of the countries would finance its own infrastructure, and a project would be formulated for UNDP or some other international agency for the training and meetings necessary for carrying out the design and for covering the costs involved in disseminating the chip. From the point of view of REMLAC, such a project would be of value, both in strategic and commercial terms, to the countries involved and would result in an installed infrastructure for the production of custom-designed circuits within the region.

(7) Specialized "centres of excellence" to promote and carry out research and development and applictions including centres in industry or working in close co-operation with industry and networking of such centres. As envisaged in the structure of the network, several regional nodes could be thought of which could function as "centres of excellence" in specific facets of microelectronics technology. Reference may be made in this connection to the findings of a group of experts in regard to the potentiality of the Fundacion Instituto de Ingenieria to function as a regional node. Other "centres of excellence" could also be identified. The UNIDO secretariat, on request, may be able to assist the identification of such "centres of excellence" in the region by the provision of a few man-months of consultancy services. An important component of the activities of "centres of excellence" should be the close relationship with industry so as to transfer research results to industry. Policy measures for this purpose may also have to be adopted at the national level in participating countries.

5/ UNIDO/IS.444, "A silicon foundry to service developing countries needs : a preliminary approach".

(8) Conduct of feasibility studies and establishment or expansion of plants for the production of microelectronics components and all interface elements. The conduct of feasibility studies for multinational enterprises in one or more aspects related to microelectronics technology would be an area worth pursuing. This would, however, require the agreement among two or more countries on an integrated strategy for production of microelectronics components. The possibility of formation of subsidiaries by existing Latin American multinational enterprises may also be considered.

(9) Training of manpower and reversal of brain drain. Already there are several formal and informal training courses in which co-operation among Latin American countries is taking place. They will have to be improved and expanded. It is also expected that specialized "centres of excellence" and design centres will incorporate in their activities as an essential element the training of manpower of participating countries. In addition, the necessary machinery should be created for the exchange of teachers, the awards of fellowships and the development of curricula, as well as for regional complementarity in various areas of microelectronics. In particular, it would be useful to design courses for the purpose of creating new groups in those areas of microelectronics not yet represented in every country.

In regard to reversal of brain drain one activity that could be initiated is the compilation of a roster of Latin American experts who would be willing to assist countries in this region by visiting those countries and providing advice, by accepting trainees in their institutions and by working in one of the institutions in the region for a period of time. Each participating country could initiate the preparation of such a roster on a commonly agreed format.

Information should also be developed on the availability of microelectronics experts and consultants, both in the region's research and development institutions and its industry, whose services might be of value to other countries.

(10) Standards, quality control and harmonization. Though the microelectronics industry is still expanding rapidly and no clear picture would appear to have emerged concerning standardization it would be useful to initiate a set of activities for this purpose. It is hoped that this question will be discussed on the basis of detailed information in a future meeting of the network.

It would be desirable if within the region a number of generally accepted standards could be established for both components and equipment. This would lead to greater compatibility of products manufactured by the various sectors of the industry, which in turn would permit the more extensive integration of equipment at the regional level. Moreover, the adoption of common standards would introduce a high level of compatibility for equipment manufactured within the region and greater independence from countries outside the region.

With the possible exception of Brazil, the region lacks extensive experience in quality control techniques and in electronic component and equipment production methodology. There is an evident need to implement a joint project to make it possible, specifically, to draw on the existing experience as a means of learning the various techniques of equipment evaluation and control. The basic idea would be to develop the necessary technology so as to achieve regionally the kind of procedures for test evaluation and standardization that will also satisfy international requirements.

A co-operative effort to introduce unified approach to software development (e.g. identification of UNIX as recommendable software approach) also requires consideration.

(11) Exchange of information. It may be useful to consider mechanisms for such exchange of information including a regional newsletter drawing upon, for example, the UNIDO Microelectronics Monitor.

There must be greater communication between the countries comprising REMLAC and greater publicity of all their activities, both of a commercial nature and in the area of research and development. This will be a very important task for the nodal points of REMLAC. Consideration should also be given to the possibility of creating permanent sections on Latin American activities in already existing journals, such as the Journal de Microelectronica (Brazil), the Revista Telegrafica Electronica (Argentina) and TEC (Venezuela).

REMLAC might also encourage the writing of articles on programmes, actions and achievements in regional microelectronics and promote their distribution to the principal newspapers as a means of generating a greater awareness of this subject.

There is likewise a need to publicize the work being performed by the research and development institutions of the region.

(12) Strengthening negotiating capacities for acquisition of technology. A number of microelectronics products, technology and software are and will continue to be imported by one or more countries in the region. Activities to strengthen negotiating capacities and to exchange experience in this regard are required. Guidelines need to be developed and if possible harmonized in matters such as licensing of software.

(13) Intraregional trade in microelectronics products, equipment and software will have to be promoted and measures for this purpose identified. In this regard there is a need to compile information on existing national capabilities.

(14) As part of network activities advisory services from experts from outside and inside the region will have to be organized to assist national and regional nodes.

(15) Annual or bi-annual meetings of network participants would themselves be an important activity of the network since they will provide an occasion for exchange of information, review and evaluation of the work programme and decisions on future activities. In regard to future network meetings, it is suggested that the country in which the network meeting may be held may finance the travel and per diem of national network participants for that meeting.

It will be seen that the network has a variety of areas and activities to choose from. The priorities and the phasing of the activities have to be decided, keeping in mind the need to achieve a critical mass. Some of the activities such as exchange of information, policy research and monitoring may not require much funding, whereas activities such as upgrading specialized "centres of excellence" will do so. The latter activities as well as those relating to application possibilities and training of manpower would require the identification of high-level specialists within the region.

Modalities

The present meeting should itself enable the formulation of guidelines for the drawing up of a programme for the network and also identify the contents of such a programme in broad terms. A few interim activities should also be identified for immediate implementation.

After the meeting identifies the contents of the programme as indicated above, a small group of experts drawn from the UNIDO, SELA and ECLAC secretariats, combined with any country experts who may wish to participate at their own expense may elaborate a detailed programme in the form of one or more interrelated and consistent projects. In drawing up this programme contacts may be established with policy makers in several countries wherever possible. The programme so elaborated may be submitted to funding agencies, such as UNDP, as may be decided by the meeting.

It is suggested that the drawing up of such a programme and its submission to the funding agencies should be completed by December 1985.

Action by the Meeting

The meeting is requested to consider this note and agree upon (a) the general guidelines for drawing up a programme for the network; and (b) the modalities of preparing the overall programme and several projects within that programme; and identify (c) specific areas of action with which the programme and the projects may concern themselves and (d) possible funding arrangements. Based on the conclusions of the meeting further action could be taken to elaborate the programme in detail with a view to its early implementation.